

PATENT COOPERATION TREATY

From the
INTERNATIONAL SEARCHING AUTHORITY

PCT

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY (PCT Rule 43bis.1)

To: <div style="text-align: center; padding-top: 20px;">see form PCT/ISA/220</div>		<div style="border: 1px solid black; padding: 5px; margin-top: 20px;"> Date of mailing (day/month/year) see form PCT/ISA/210 (second sheet) </div>	
Applicant's or agent's file reference see form PCT/ISA/220		FOR FURTHER ACTION See paragraph 2 below	
International application No. PCT/JP2006/300322 /	International filing date (day/month/year) 06.01.2006 /	Priority date (day/month/year) 06.01.2005 /	
International Patent Classification (IPC) or both national classification and IPC INV. H04L27/36			
Applicant MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD. /			

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☐ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☐ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43bis.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☒ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA") except that this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notified the International Bureau under Rule 66.1bis(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of 3 months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA: <div style="display: flex; align-items: center;"> <div> European Patent Office - Gitschiner Str. 103 D-10958 Berlin Tel. +49 30 25901 - 0 Fax: +49 30 25901 - 840 </div> </div>	Date of completion of this opinion see form PCT/ISA/210	Authorized Officer Masche, C Telephone No. +49 30 25901-471
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**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2006/300322

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of:
 - ☒ the international application in the language in which it was filed
 - ☐ a translation of the international application into , which is the language of a translation furnished for the purposes of international search (Rules 12.3(a) and 23.1 (b)).
2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:
 - a. type of material:
 - ☐ a sequence listing
 - ☐ table(s) related to the sequence listing
 - b. format of material:
 - ☐ on paper
 - ☐ in electronic form
 - c. time of filing/furnishing:
 - ☐ contained in the international application as filed.
 - ☐ filed together with the international application in electronic form.
 - ☐ furnished subsequently to this Authority for the purposes of search.
3. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
4. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.
2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.
3. Additional observations, if necessary:

**WRITTEN OPINION OF THE
INTERNATIONAL SEARCHING AUTHORITY**

International application No.
PCT/JP2006/300322

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes: Claims	1-31
	No: Claims	
Inventive step (IS)	Yes: Claims	1-20, 24, 26-30
	No: Claims	21-23, 25, 31
Industrial applicability (IA)	Yes: Claims	1-31
	No: Claims	

2. Citations and explanations

see separate sheet

Box No. VIII Certain observations on the international application

The following observations on the clarity of the claims, description, and drawings or on the question whether the claims are fully supported by the description, are made:

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Reference is made to the following documents:

D1: US 2004/219891 A1 (HADJICHRISTOS ARISTOTLE) 4 November 2004 (2004-11-04)

D2: WO 2004/019486 A (ROKE MANOR RESEARCH LIMITED; DOMOKOS, JOHN; SMITH, CHRISTOPHER, NIGEL) 4 March 2004 (2004-03-04)

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 21 to 23, 25 and 31 does not involve an inventive step in the sense of Article 33(3) PCT.

2.1 The document D1 is regarded as being the relevant prior art to the subject-matter of independent claim 21 and discloses (the references in parentheses applying to this document):

A polar modulator (30) comprising:
a power amplification section (36),
a phase modulation section (42) for generating a first modulated signal including phase information,
an amplitude signal control section (38) for generating a second modulated signal (AM2) including amplitude information,
an amplitude modulated voltage supply section (40) for amplifying the second modulated signal using a transistor (Q10) based on a supply voltage (V1) for supplying the amplified signal to the power amplification section as an amplitude modulated voltage,
the power amplification section (36) being adapted to amplify the first modulated signal based on the amplitude modulated voltage and to output a third modulated signal (RF OUT) obtained as a result of modulating an amplitude of

the first modulated signal,

wherein

the supply voltage (V1) is supplied, at which the transistor (Q10) is operated in a constant current region, to the amplitude modulated voltage supply section (40).

- 2.2 D1 does not disclose a voltage control section that supplies the supply voltage. Therefore, the subject-matter of independent claim 21 is new (Article 33(2) PCT).

However, including such a voltage control section, e.g. a switching voltage regulator or a series voltage regulator, in any kind of electronic circuitry is a common measure. Consequently, implementing this feature into the polar modulator is obvious and the subject-matter of claim 21 does not involve an inventive step in the sense of Article 33(3) PCT.

- 2.3 D1 also discloses:

A wireless communication apparatus comprising a baseband section (44), an antenna section (142), a receiving section (36), a common section (144) and a transmission section (30) including a polar modulator as set-out above.

Therefore, the subject-matter of independent claim 31 does not involve an inventive step.

- 2.4 The additional features of dependent claims 22, 23 and 25, as far as they are not already disclosed by D1, are regarded as design options for a skilled person. Therefore, the subject-matter of these claims does not involve an inventive step.

3. Document D1 is also regarded as relevant state of the art to the subject-matter of independent claims 1, 11, 29 and 30.

- 3.1 The subject-matter of the independent claims 1 and 29 differs from this known polar modulator in that it comprises:

a waveform shaping section for, when an amplitude of the second modulated signal is larger than a predetermined value, generating a waveform-shaped modulated signal obtained as a result of shaping a waveform of the second modulated signal which exceeds the predetermined value becomes equal to or smaller than the predetermined value,
and a voltage control section for outputting a supply voltage to the amplitude modulated voltage supply.

The subject-matter of claims 1 and 29 is therefore new (Article 33(2) PCT).

- 3.2 The subject-matter of the independent claims 11 and 30 differs from the known polar modulator in that it comprises:

a voltage control section adapted to supply a voltage, obtained based on a maximum value of the amplitude modulated voltage which is output from the transistor, to the amplitude modulated voltage supply section as supply voltage.

- 3.3 The problem to be solved by the new features of claims 1, 11, 29 and 30 may be regarded as how to improve the trade-off between power efficiency and ACPR.
- 3.4 The solutions to this problem proposed in claims 1, 11, 29 and 30 of the present application are not disclosed by any of the documents cited in the International search report and are not regarded as common general knowledge in the field of modulators. Therefore, the subject-matter of these claims is considered as involving an inventive step (Article 33(3) PCT).
- 3.5 Claims 2 to 10 and 12 to 20 are dependent on claims 1 or 11 and as such also meet the requirements of the PCT with respect to novelty and inventive step.
- 3.6 The additional features of claims 24 and 26 to 28 depending directly or indirectly on claim 21 are similar to the new features of claims 1 or 11. Therefore, the subject-matter of these claims is considered as inventive.

Re Item VII

Certain defects in the international application

The features of the claims are not provided with reference signs placed in parentheses (Rule 6.2(b) PCT).

Re Item VIII

Certain observations on the international application

1. The application does not meet the requirements of Article 6 PCT, because at least some of the claims are not clear or not supported by the detailed description.
2. The expression "regulated" used as an adjective for the "predetermined value" in some of the claims has no clear meaning in the context of the claims and could be replaced by the terms "peak limit" used throughout the description.
3. All of the claims are related to apparatus, however, features like "amplifies", "adjusts", "changes" etc. are method steps rendering the category of the corresponding claims unclear.
4. The feature of claim 5 that the "waveform shaping section changes the number of subcarriers used" is not supported by the detailed description and, by the way, doesn't seem to make sense.